Amendments to the Drawings:

The attached sheets of drawings, including the blurry FIG. 10, replace the original sheets of drawings for FIGS. 9, 10, 11 and 12.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

In response to the Office Action dated September 11, 2009, claims 1-6 and 16-24 remain pending in this application. Claims 22 and 23 were amended for clarification. Claims 7-15 and 25-44 were previously withdrawn in response to a restriction requirement. Reexamination and reconsideration of the application in view of the clarifications and arguments below are respectfully requested.

Drawings

The Examiner objected to the drawing of Fig. 10 because it was very blurry and the Examiner could not read the numbers.

The Applicant has submitted corrected sheets in conformance with 37 CFR 1.121(d) for FIGS. 9-12.

Claim Objections

Claims 22 and 23 were objected to because they were worded as system claims when they depend upon claim 21 which is a method claim.

The Applicant has amended claims 22 and 23 to be method claims.

Claim Rejections Under 35 USC § 102(b)

Claims 1-6 were rejected under 35 USC 102(b) as being anticipated by Marcu et. al. (US 6,272,376). In short, the Examiner stated that col. 3, lines 65 to col. 4, lines 67 of the Marcu '376 patent anticipate the claims. A discussion of the difference between the Marcu '376 patent and that of the present invention will help to show that the two are not the same, and that independent claim 1 is allowable.

Marcu '376 states at col. 3, lines 65 to col. 4, lines 67 the following:

> "In particular, determining the time-resolved emission includes applying an appropriate deconvolution algorithm to obtain the true fluorescence impulse response function of the

> reemitted light at the one or more component wavelengths. Examples of appropriate algorithms are the Laguerre expansion of kernels (…) or multi-exponential decay (…)."

Marcu '376 uses a deconvolution algorithm to obtain the true fluorescence impulse response function (FIRF). It is then the FIRF (not the Laguerre expansion) that is used to characterize a sample. The true FIRF is what is needed for the detection and classification of organic matter. There are many ways to obtain the true FIRF as taught by Marcu '376. See col. 2, lines 45-58:

> "The measured fluorescence decay of a fluorophore excited by a short pulse of light is a convolution of the excitation pulse shape (distorted by the detection system) with the true fluorescence decay (fluorescence impulse reponse function (FIRF)): $y(t) = \int oIf(\tau)x(t-\tau)d\tau$
>
> Since accurate determination of the fluoroscense impulse response is an important issue for the time-resolved studies, numerous deconvolution techniques, such as Least-squares iterative reconvolution method, method of moments, Laplace Transforms, and Fourier Transforms have been developed and are well known in the art."

Marcu '376 teaches that many deconvolution algorithms may be used to arrive at the FIRF, the Laguerre expansion being one such algorithm. It is the FIRF that is then used to classify organic matter. This is different than what the Applicant teaches in the present application. Rather than using the FIRF to classify organic matter, the Applicant uses the Laguerre expansion directly to classify matter. More specifically, the Applicant uses the coefficients of the Laguerre expansion for the direct characterization of the biological system, for classification purposes, and for determining the concentration of the fluorescent

molecular species within the biological system. This is a more accurate and quick method as compared to using FIRF to classify organic matter.

This distinction is highlighted by the Applicant at the beginning of the SUMMARY OF THE INVENTION starting on page 3 and continuing onto page 4:

> "The present invention discloses a method and system utilizing conventional tools for generation and measurement of fluorescence for the analysis of fluorescence emission decay data which describes the intensity and the lifetime (temporal) characteristics of the fluorescence emission of a biochemical system in terms of a set of quantitative descriptors. The descriptors correspond to the coefficients of an expansion of the intrinsic fluorescence emission decay on an orthogonal family of mathematical functions, known as the Laguerre basis. The intrinsic fluorescence decay *h(n)* of a chemical/biochemical sample is thus expressed as:
>
> $$h(n) = \sum_{j=0}^{L-1} cjb\alpha j(n)$$
>
> where c_j are the expansion coefficients and represent the descriptors used by this method. These descriptors completely characterize the time-resolved and steady-state fluorescence spectra of the sample. These descriptors can be directly used to calibrate fluorescence time-resolved data for the prediction of concentrations in a mixture of chemical/biochemical components, allowing for direct characterization and classification of biochemical systems."

The invention in the present application does not use the FIRF for classification purposes, rather the coefficients of the Laguerre expansion are now directly used. Claim 1 encompasses this difference that the Marcu '376 patent

never taught, and accordingly the claim is allowable and the 102(b) rejection should be withdrawn.

Claim Rejections Under 35 USC § 103(a)

Claims 16-23 were rejected under 35 USC 103(a) as being unpatentable over Marcu et al. (US 6,272,376) and in view of Maarek et. al. (Time-resolved Fluorescence Spectra of Arterial Fluorescent Compounds: Reconstruction with the Laguerre Expansion Technique).

"To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985); MPEP 706.02(j). In the present application the references do not suggest the claimed the invention, whether obvious or not. Said differently, even if one was to combine the references in hindsight, they do not result in the Applicant's invention as claimed and therefore cannot be obvious.

More specifically, the Maarek article refers solely to time-resolved fluorescence spectroscopy (TRFS) data. There are no pixels and maps of lifetimes associated with the spectroscopy data. Claim 16 refers to the analysis of fluorescence lifetime imaging microscopy (FLIM) data or images. FLIM will map the chemical composition of a sample on a large area and then resolve this area at the pixel level. Each pixel will be characterized by a FIRF. Therefore, one can constitute a lifetime map of the sample fluorescence. The Laguerre method allows for a fast deconvolution FIRF from each pixel in the image. The use of Laguerre coefficients to directly characterize the fluorescence decay in a FILM image was not contemplated by either the Marcu '374 patent or by combining Maarek. Accordingly, the claims are patentable and the 103(a) rejection should be withdrawn. In view of the foregoing, it is submitted that the application is in condition for allowance, notice of which is respectfully requested.

Request for Examiner Interview

Should the Examiner not find the foregoing arguments and comments helpful or persuasive, Applicant requests an interview with the Examiner in order to review the prior art and the claims.

Respectfully submitted,

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